



State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

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February 28, 1992

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Dear Mr. 2~:

Re: Coal Mine Surface Blaster Certification

Enclosed you will find information which documents your recent qualification as a Coal Mine Surface Blaster under the Utah Coal Regulatory Program. You will find a certificate and pocket card; each of which affirms your certification. For the purpose of inspection, either of these forms of affirmation will suffice as evidence of your achievement of this certification, but I suggest that you place the certificate on file at your mine office and that you carry the card.

Division rules R645-105 and R645-524 set forth the Division's requirements for blasting certification and blasting operations. Both of these rules have been copied for you and are enclosed. Please note the expiration date of your certification and renew your training in advance to assure continuity of status.

If you have any questions or have suggestions that you feel might improve the Blaster Certification Program, please contact the Division.

Best regards,

Dianne R. Nielson
Director

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Enclosures
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R645- Natural Resources, Oil, Gas and Mining, Coal.**R645-105- Administrative: Blaster Training, Examination and Certification.****100. Introduction****200. Training****300. Examination****400. Certification****R645-105- Administrative: Blaster Training, Examination and Certification.****R645-105-100. Introduction.**

The rules in R645-105-100 present the requirements for blaster training, examination and certification at coal mining and reclamation operations. The Division is empowered to delegate, through contract or other means, the blaster training, examination, and certification program or any part thereof. The object of such delegation will be to minimize duplication of efforts of Utah agencies in certifying, licensing, or training mining personnel.

R645-105-200. Training.

210. To receive certification, a blaster will receive training from a program approved by the Division. Training may be provided by a permittee, industry, and/or the Division.

220. Training includes, but is not limited to, the technical aspects of blasting operations, and Utah and federal laws governing the storage, transportation, and use of explosives. Blasting courses will provide training and discuss practical applications of explosives.

230. Persons who are not certified and who are assigned to a blasting crew or assist in the use of explosives will receive direction and on-the-job training from a blaster.

240. Training will include course work in, and discuss the practical application of:

241. Explosives, including:

241.100. Selection of the type of explosive to be used;

241.200. Determination of the properties of explosives which will produce desired results at an acceptable level of risk; and

241.300. Handling, transportation, and storage;

242. Blast designs, including:

242.100. Geologic and topographic considerations;

242.200. Design of a blast hole, with critical dimensions;

242.300. Pattern design, field layout, and timing of blast holes; and

242.400. Field applications;

243. Loading blast holes, including priming and boosting;

244. Initiation systems and blasting machines;

245. Blasting vibrations, airblasts and flyrock, including:

245.100. Monitoring techniques; and

245.200. Methods to control adverse effects;

246. Secondary blasting applications;

247. Current federal and Utah rules applicable to the use of explosives;

248. Blast records; and

249. Schedules.

250. Training will also include coursework in, and discuss the practical application of:

251. Preblasting surveys, including:

251.100. Availability;

251.200. Coverage; and

251.300. Use of in-blast design;

252. Blast-plan requirements;

253. Certification and training;

254. Signs, warning signals, and site control; and

255. Unpredictable hazards, including:

255.100. Lightning;

255.200. Stray currents;

255.300. Radio waves; and

255.400. Misfires.

R645-105-300. Examination.

310. Candidates for blaster certification will meet the following qualifications:

311. Have one year practical field experience involving blasting prior to taking the examination;

312. Take an approved blaster training course as required by R645-105-210; and

313. Pass the written examination;

320. Examination will be administered by the Division or its designee and will include, at a minimum, the topics set forth in R645-105-240 and R645-105-250.

R645-105-400. Certification.

410. Upon successful completion of the training and examination process identified in R645-105-200 and R645-105-300, the candidate for blasting certification will be awarded a certificate for three years from the date of issuance.

420. Blasting certificates may be renewed by attending a refresher course approved by the Division.

430. Refresher courses will review the topics identified in initial training in R645-105-200.

440. Suspension and revocation of certification.

permit area. The description will include a map, appropriate cross sections, and specifications for each road width, road gradient, road surface, road cut, fill embankment, culvert, bridge, drainage ditch, drainage structure, and each stream ford that is used as a temporary route.

- 521.180. Support facilities. Each permit applicant will submit a description, plans, and drawings for each support facility to be constructed, used, or maintained within the proposed permit area. The plans and drawings will include a map, appropriate cross sections, design drawings, and specifications to demonstrate compliance with R645-301-526.220 through R645-301-526.222 for each facility.
- 521.190. Other relevant information required by the Division.
- 521.200. Signs and Markers Specifications. Signs and markers will:
 - 521.210. Be posted, maintained, and removed by the person who conducts the coal mining and reclamation operations;
 - 521.220. Be a uniform design that can be easily seen and read; be made of durable material; and conform to local laws and regulations;
 - 521.230. Be maintained during all activities to which they pertain;
- 521.240. Mine and Permit Identification Signs.
 - 521.241. For the purposes of UNDERGROUND COAL MINING AND RECLAMATION ACTIVITIES, identification signs will be displayed at each point of access from public roads to areas of surface operations and facilities on permit areas;
 - 521.242. For the purposes of SURFACE COAL MINING AND RECLAMATION ACTIVITIES, identification signs will be displayed at each point of access to the permit area from public roads;
 - 521.243. Show the name, business address, and telephone number of the permittee who conducts coal mining and reclamation operations and the identification number of the permanent program permit authorizing coal mining and reclamation operations; and
 - 521.244. Be retained and maintained until after the release of all bonds for the permit area;
- 521.250. Perimeter Markers.
 - 521.251. For the purposes of UNDERGROUND COAL MINING AND RECLAMATION ACTIVITIES, the perimeter of all areas affected by surface operations or facilities before beginning mining activities will be clearly marked; or
 - 521.252. For the purposes of SURFACE COAL MINING AND RECLAMATION ACTIVITIES, the perimeter of a permit area will be clearly marked before the beginning of surface mining activities;
- 521.260. Buffer Zone Markers.
 - 521.261. For the purposes of UNDERGROUND COAL MINING AND RECLAMATION ACTIVITIES, signs will be erected to mark buffer zones as required under R645-301-731.600 and will be clearly marked to prevent disturbance by surface operations and facilities; or
 - 521.262. For the purposes of SURFACE COAL MINING AND RECLAMATION ACTIVITIES, buffer zones will be marked along their boundaries as required under R645-301-731.600; and
- 521.270. Topsoil Markers. Markers will be erected to mark where topsoil or other vegetation-supporting material is physically segregated and stockpiled as required under R645-301-234.
- 522. Coal Recovery. The permit application will include a description of the measures to be used to maximize the use and conservation of the coal resource. The description will assure that coal mining and reclamation operations are conducted so as to maximize the utilization and conservation of the coal, while utilizing the best technology currently available to maintain environmental integrity, so that re-affecting the land in the future through coal mining and reclamation operations is minimized.
- 523. Mining Method(s). Each application will include a description of the mining operation proposed to be conducted during the life of the mine within the proposed permit area, including, at a minimum, a narrative description of the type and method of coal mining procedures and proposed engineering techniques, anticipated annual and total production of coal, by tonnage and the major equipment to be used for all aspects of those operations.
 - 523.100. SURFACE COAL MINING AND RECLAMATION ACTIVITIES proposed to be conducted within the permit area within 500 feet of an underground mine will be described to indicate compliance with R645-301-523.200.
 - 523.200. No SURFACE COAL MINING AND RECLAMATION ACTIVITIES will be conducted closer than 500 feet to any point of either an active or abandoned underground mine, except to the extent that:
 - 523.210. The operations result in improved resource recovery, abatement of water pollution, or elimination of hazards to the health and safety of the public; and
 - 523.220. The nature, timing, and sequence of the activities that propose to mine closer than 500 feet to an active underground mine are jointly approved by the Division and MSHA.
- 524. Blasting and Explosives. For the purposes of SURFACE COAL MINING AND RECLAMATION ACTIVITIES, each permit application will contain a blasting plan for the proposed permit area explaining how the applicant will comply with R645-301-524. This plan will include, at a minimum, information setting forth the limitations the operator will meet with regard to ground vibration and airblast, the bases for those limitations, and the methods to be applied in controlling the adverse effects of blasting operations. Each blasting plan will also contain a description of any system to be used to monitor compliance with the standards of R645-301-524.600 including the type, capability, and sensitivity of any blast-monitoring equipment and proposed procedures and locations of monitoring. Blasting operations conducted within 500 feet of active underground mines require approval of MSHA. Blasts that use more than five pounds of explosive or blasting agent will be conducted according to the schedule required under R645-301-524.400. For the purposes of UNDERGROUND COAL MINING AND RECLAMATION ACTIVITIES, R645-301-524.100 through R645-301-524.700 apply to surface blasting activities incident to underground coal mining, including, but not limited to, initial rounds of slopes and shafts.

- 524.451. Publish the blasting schedule in a newspaper of general circulation in the locality of the blasting site at least ten days, but not more than 30 days, before beginning a blasting program;
- 524.452. Distribute copies of the schedule to local governments and public utilities and to each local residence within one-half mile of the proposed blasting site described in the schedule; and
- 524.453. Republish and redistribute the schedule at least every 12 months and revise and republish the schedule at least ten days, but not more than 30 days, before blasting whenever the area covered by the schedule changes or actual time periods for blasting significantly differ from the prior announcement; and
- 524.460. **Blasting Schedule Contents.** For the purposes of SURFACE COAL MINING AND RECLAMATION ACTIVITIES the blasting schedule will contain, at a minimum:
- 524.461. Name, address, and telephone number of operator;
- 524.462. Identification of the specific areas in which blasting will take place;
- 524.463. Dates and time periods when explosives are to be detonated;
- 524.464. Methods to be used to control access to the blasting area; and
- 524.465. Type and patterns of audible warning and all-clear signals to be used before and after blasting.
- 524.500. The blasting signs, warnings, and access control must be described in the permit application.
- 524.510. **Blasting Signs.** Blasting signs will meet the specifications of R645-301-521.200. The operator will:
- 524.511. Conspicuously place signs reading "Blasting Area" along the edge of any blasting area that comes within 100 feet of any public-road right-of-way, and at the point where any other road provides access to the blasting area; and
- 524.512. At all entrances to the permit area from public roads or highways, place conspicuous signs which state "Warning! Explosives in Use", which clearly list and describe the meaning of the audible blast warning and all-clear signals that are in use, and which explain the marking of blasting areas and charged holes awaiting firing within the permit area.
- 524.520. **Warnings.** Warning and all-clear signals of different character or pattern that are audible within a range of one-half mile from the point of the blast will be given. Each person within the permit area and each person who resides or regularly works within one-half mile of the permit area will be notified of the meaning of the signals in the blasting schedule for the purposes of SURFACE COAL MINING AND RECLAMATION ACTIVITIES and blasting notification required by R645-301-524.430 for the purposes of UNDERGROUND COAL MINING AND RECLAMATION ACTIVITIES.
- 524.530. **Access Control.** Access within the blasting areas will be controlled to prevent presence of livestock or unauthorized persons during blasting and until an authorized representative of the operator has reasonably determined that:
- 524.531. No unusual hazards, such as imminent slides or undetonated charges, exist; and
- 524.532. Access to and travel within the blasting area can be safely resumed.
- 524.600. The control of adverse blasting effects must be described in the permit application. The requirements are:
- 524.610. **General Requirements.** Blasting will be conducted to prevent injury to persons, damage to public or private property outside the permit area, adverse impacts on any underground mine, and change in the course, channel, or availability of surface or ground water outside the permit area.
- 524.620. **Airblast Limits.**
- 524.621. Airblast will not exceed the maximum limits listed below at the location of any dwelling, public building, school, church, or community or institutional building outside the permit area, except as provided in R645-301-524.690.
- | Lower Frequency Limit of Measuring System, HZ(+3dB) | Maximum Level dB |
|---|------------------|
| 0.1 Hz or lower - flat response(1) | 134 peak |
| 2 Hz or lower - flat response | 133 peak |
| 6 Hz or lower - flat response | 129 peak |
| C-weighted - slow response(1) | 105 peak dBC |
- (1) Only when approved by the Division.
- 524.622. If necessary to prevent damage, the Division may specify lower maximum allowable airblast levels than those of R645-301-524.621 for use in the vicinity of a specific blasting operation.
- 524.630. **Monitoring.**
- 524.631. The operator will conduct periodic monitoring to ensure compliance with the airblast standards. The Division may require airblast measurement of any or all blasts and may specify the locations at which such measurements are taken.
- 524.632. The measuring systems used will have an upper-end flat-frequency response of at least 200 Hz.
- 524.633. **Flyrock.** Flyrock traveling in the air or along the ground will not be cast from the blasting site - more than one-half the distance to the nearest dwelling or other occupied structure; beyond the area of control required under R645-301-524.530; or beyond the permit boundary.
- 524.640. **Ground Vibration.**
- 524.641. **General.** In all blasting operations, except as otherwise authorized in R645-301-524.690, the maximum ground vibration will not exceed the values approved by the Division. The maximum ground vibration for protected structures listed in R645-301-524.642 will be established in accordance with either the maximum peak-particle-velocity limits of R645-301-524.642 and R645-301-524.643, the scaled-distance equation of R645-301-524.650, the blasting-

- 524.747. Initiation system;
- 524.748. Type and length of stemming; and
- 524.749. Mats or other protections used;
- 524.750. If required, a record of seismographic and airblast information, which will include:
- 524.751. Type of instrument, sensitivity, and calibration signal or certification of annual calibration;
- 524.752. Exact location of instrument and the date, time, and distance from the blast;
- 524.753. Name of the person and firm taking the reading;
- 524.754. Name of the person and firm analyzing the seismographic record; and
- 524.755. The vibration and/or airblast level recorded; and
- 524.760. The reasons and conditions for each unscheduled blast.
- 524.800. Each operator will comply with all appropriate Utah and federal laws and regulations in the use of explosives.
- 525. Subsidence. The requirements of R645-301-525 pertain to permit applications for UNDERGROUND COAL MINING AND RECLAMATION ACTIVITIES.
- 525.100. Subsidence Control Plan. The permit application will include a survey which will show whether structures and renewable resource lands exist within the proposed permit area and adjacent area and whether subsidence, if it occurred, could cause material damage and diminution of reasonably foreseeable use of such structures or renewable resource lands. If the survey shows that no such structures or renewable resource lands exist, or no such material damage or diminution could be caused in the event of mine subsidence, and if the Division agrees with such conclusion, no further information need be provided in the application under R645-301-525. In the event the survey shows that such structures or renewable resource lands exist, or that subsidence could cause material damage or diminution of value of foreseeable use of the land, or if the Division determines that such damage or diminution could occur, the application will include a subsidence control plan which will contain the following information:
- 525.110. A description of the method of coal removal, such as longwall mining, room-and-pillar removal, hydraulic mining, or other extraction methods, including the size, sequence, and timing for the development of underground workings;
- 525.120. A description of the physical conditions, such as depth of cover, seam thickness, and lithology, which affect the likelihood or extent of subsidence and subsidence-related damage;
- 525.130. Except for those areas where planned subsidence is projected to be used, a detailed description of the subsidence control measures that will be taken to prevent or minimize subsidence and subsidence-related damage, including, but not limited to:
- 525.131. Backstowing or backfilling of voids;
- 525.132. Leaving support pillars of coal;
- 525.133. Leaving areas in which no coal is removed, including a description of the overlying area to be protected by leaving the coal in place;
- 525.134. Taking measures on the surface to prevent material damage or lessening of the value or reasonably foreseeable use of the surface;
- 525.140. Monitoring, if any, to determine the commencement and degree of subsidence so that other appropriate measures can be taken to prevent or reduce material damage; and
- 525.150. A description of the anticipated effects of planned subsidence, if any;
- 525.160. A description of the measures to be taken in accordance with R645-301-525.230 to mitigate or remedy any subsidence-related material damage to, or diminution in value or reasonably foreseeable use of the land or structures or facilities; and
- 525.170. Other information specified by the Division as necessary to demonstrate that the operation will be conducted in accordance with R645-301-525.200.
- 525.200. Subsidence Control.
- 525.210. The operator will either adopt measures consistent with known technology which prevent subsidence from causing material damage to the extent technologically and economically feasible, maximize mine stability, and maintain the value and reasonably foreseeable use of surface lands; or adopt mining technology which provides for planned subsidence in a predictable and controlled manner. Nothing in this part will be construed to prohibit the standard method of room-and-pillar mining.
- 525.220. The operator will comply with all provisions of the approved subsidence control plan.
- 525.230. The operator will:
- 525.231. Correct any material damage resulting from subsidence caused to surface lands, to the extent technologically and economically feasible, by restoring the land to a condition capable of maintaining the value and reasonably foreseeable uses which it was capable of supporting before the subsidence; and
- 525.232. Either correct material damage resulting from subsidence caused to any structures or facilities by repairing the damage or compensate the owner of such structures or facilities in the full amount of the diminution in value resulting from the subsidence. Repair of damage includes rehabilitation, restoration, or replacement of damaged structures or facilities. Compensation may be accomplished by the purchase prior to mining of a noncancellable premium-prepaid insurance policy.
- 525.240. Unless excepted by R645-301-525.243, UNDERGROUND COAL MINING AND RECLAMATION ACTIVITIES will not be conducted beneath or adjacent to:
- 525.241. Public buildings and facilities;
- 525.242. Churches, schools, and hospitals;